



Chasing the Pandemic

Role of Testing and Contact Tracing

Summary

Public health officials work to keep healthy people healthy, keep them from being exposed to infectious people and work to get sick people proper treatment. How to tell which people are healthy and which are not is where testing and contact tracing comes into play.

This Report is the Santa Cruz County Grand Jury's assessment of the effectiveness of the County's COVID-19 testing and contact tracing efforts. We found that the Public Health officials in the county government are experienced professionals who met high expectations and did, indeed, mitigate the consequences of the COVID-19 pandemic by promoting testing and tracing in Santa Cruz County. The county instituted a pandemic crisis management initiative called "Save Lives Santa Cruz County" much like a crisis center established during a wildfire.

The Grand Jury recommends that the Santa Cruz County Health Services Agency publicize their efforts to keep the residents healthy during a pandemic.

Background

We have been thick in the middle of a worldwide virus-driven infectious and deadly disease (COVID-19) during 2020-2021 – a pandemic.^[1] There is an unrelenting tension between efforts to isolate people from one another to avoid virus spread and to allow people to perform those interactive activities that make us a functioning society.

There are basically four things that can be done to slow or stop an epidemic:

1. Isolate infected people.
2. Urge everyone to follow procedures like wearing masks and social distancing to slow or stop the silent movement of viruses from one person to another.
3. Conduct extensive testing and contact tracing in order to identify those at risk.
4. Develop and deliver vaccines.

Importance of Testing and Contact Tracing

It is undeniable that testing and contact tracing saves lives but is nearly impossible to quantify. Lives are saved by reducing the spread when public health officials call for more testing. Testing and tracing can stop an epidemic dead in its tracks in cases when contact tracing moves faster than the infection can spread. In those cases it is clear that lives were saved. Unfortunately, this is not the situation for COVID-19.^{[2] [3] [4]}

Our investigation focused on testing and contact tracing in large part because we found it complex, critically important and not well publicized.

Testing and Contact Tracing

Who is in charge of testing and contact tracing in Santa Cruz County? Well, nobody and everybody! Our Local Health Jurisdiction is operated by the Public Health Division (PHD), a division of the Santa Cruz County Health Services Agency (HSA).^[5] It is a part of the nationwide public health infrastructure, responsible for implementing mandates from federal, state and local sources.^{[6] [7]} A Local Health Officer of the County is legally empowered to issue binding health orders.^[7]

Who is doing testing is quite different from who is doing contact tracing.

Testing

Let's talk first about testing; that is, testing to see if a person actually has the COVID-19 infectious disease. The PHD seldom does any testing itself. So who does? Well that's where the "everybody" comes in and it includes:

- Dominican Hospital and Watsonville Community Hospital (we have those 2),
- healthcare clinics (we have 7 federally qualified healthcare centers),
- healthcare companies like Sutter/PAMF, Dignity, and Kaiser (we have those 3),
- skilled nursing facilities (of which we have 7),
- residential healthcare facilities (of which we have over 30),

- detention facilities (of which we have 6),
- schools (more than 27 private and 57 public),
- drug stores and grocery stores (3 chain drug stores, 5 groceries chains with pharmacies),
- other healthcare facilities like doctors' offices (a large number),
- special testing sites established by the state and organized more locally (we have 2),
- and even individuals in their own homes.

This is the “everybody.” Is this diversity/complexity good or not? We attempt to shed light on this question in the Investigation section below.

The Two Parts to Testing

All of these places do not produce test results directly on site. They collect specimens from the patients and most send the obtained specimens to licensed clinic laboratories that must have a Clinical Laboratory Improvement Amendments (CLIA) certification.^[8] Some offer testing with on-site results. There are rules and laws requiring that every test be logged into a state Internet based website/database.^[9] This is, in part, to enable contact tracing. Becoming a CLIA certified site includes being able to register all test results with the state. Some companies who sell on-site tests also offer tools for registering results with the state.

Contact Tracing

Contact tracing is a labor intensive activity: gathering information from an infected person and attempting to contact each person they might have infected. Unlike testing, this is inherently a centralized activity orchestrated by our PHD and includes HSA personnel as well as volunteers.^[10] Tracers access the state database and follow all reported positive cases.

Other Government Health Agencies

There are four other government health agencies that influence our local healthcare infrastructure: the Center for Disease Control and Prevention (CDC),^[11] the Food and Drug Administration (FDA),^[12] The Federal Emergency Management Agency (FEMA)^[13] and the California Department of Public Health (CDPH).^[14] More about these agencies is discussed in context of the Investigation section below.

There is much more to tell about testing and contact tracing in Santa Cruz County, the healthcare infrastructure including the requirement for a local fast-turnaround laboratory, and how well the public has been informed about COVID-19 related activities. As investigators, we found we were rather uninformed before we started. A well written article from the Missouri Department of Health and Senior Services lays out the scope of local public health organizations.^[15]

Scope and Methodology

The Grand Jury conducted many interviews. We sought to understand what testing is done in the county, where it is done and how citizens get tested. We also dug into what testing is all about and how the federal efforts, in the early days of the pandemic, thwarted local efforts and set the direction for testing and contact tracing for the rest of the pandemic.^{[16][17]}

The investigation reviewed a few documents from people interviewed. The investigation also looked at a large number of reports, data and media articles found on the Internet. This opened and deepened our understanding and our view of the United States public health infrastructure and history, and how it impacts our local public health programs.

Investigation

Terminology Check

In the discussion that follows and in order to be precise, we offer the following:

- Viruses are officially named by the International Committee on Taxonomy of Viruses and on February 11, 2020 they named the one that has caused the 2020-2021 pandemic “SARS-CoV-2” (severe acute respiratory syndrome coronavirus 2).^[18]
- Diseases are officially named by the World Health Organization (WHO) in the International Classification of Diseases and they named the disease caused by the SARS-CoV-2 virus “COVID-19” also on February 11, 2020.^[18]

CDC and Laboratory Tests to Detect SARS-CoV-2

The United States Food and Drug Administration (FDA)^[12] must give approval to the manufacturers of most medical equipment, medicines and procedures before they can be deployed. In addition, laboratories that process specimens taken from patients must also obtain a Clinical Laboratory Improvement Amendments (CLIA) license from the Centers for Medicare & Medicaid Services.^{[8][19]}

Before the start of 2020 there were no mass tests devised to detect if a person was infected with the SARS-CoV-2 virus. On January 13, 2020 the WHO published a recipe from a WHO partner laboratory for how to configure such a test, a reverse transcription polymerase chain reaction (RT-PCR) test.^[20] Concurrently the U.S. CDC began to develop its own recipe for a RT-PCR test for distribution to laboratories in the U.S. This CDC effort has been the standard practice in the past for other infectious diseases. It is a testament to the US researchers’ scientific knowledge and skill that the tests were developed quickly.

The CDC obtained an Emergency Use Authorization (EUA) from the FDA for its testing process on February 4, 2020 and soon thereafter began shipping the necessary reagents and instructions to U.S. laboratories – “testing kits.”^[21] Soon, after 120 laboratories began to use the CDC materials, the tests were found to produce too many

false positives (detected the disease falsely). Use of the tests was halted and caused the country to miss approximately 47 days of testing at the very early stages of the pandemic when testing is most critical.^[22] The CDC plan was for the tests to be more sensitive than the WHO test, and also include checks for influenza. Making a more complicated test was a contributor to the delay.^[16] There was also a report of contamination in one of their laboratories.^{[23][17]} Weeks were spent within the CDC research laboratories to find a fix for the test and by February 26, 2020 the CDC again began shipping its kits.^[16]

The main point for explaining this is that clinical laboratories in the U.S. were expecting to use the methods and supplies that would be provided by the CDC as they had done many times in the past; this time to test for SARS-CoV-2.

The CDC delay contributed to the FDA decision to relax its rules allowing private companies to develop and market tests based upon self assessment.^[24] Under self assessment, the quality of the tests mirrors the quality and honesty of the company producing them and the quality of the tests available using an EUA varies from *nearly useless* to comparable to the final version of the CDC tests. If the FDA had certified tests as being effective rather than by self assessment, it could have been a boon.

This FDA offer of EUA's opened the floodgates for hundreds of companies to offer tests of undetermined value making a complex situation even more confusing. By April 23, 2021, 358 tests and sample collection devices had been authorized by the FDA under EUAs. See [Appendix A](#).

Testing to Prevent Breakouts (Diagnostic Testing)

Healthcare Facilities

Hospitals, doctors' offices, urgent care centers and any other place where sick people go for care, have to protect themselves from a contagious disease breakout. A breakout in one of these places not only impacts the people who get the disease but it will likely shut down the facility for weeks. They need to know if a new arrival has, say, COVID-19, within minutes not days. So shipping test specimens off to laboratories just doesn't work. Those laboratories were so busy that their delays sometimes reached a week or more. Below we discuss how scientists at the University of California at Santa Cruz (UCSC) Molecular Diagnostic Laboratory did the extraordinary thing of establishing a local authorized fast-turnaround commercial facility.^[25]

Congregate Living Facilities

Of concern for breakouts equal to that of healthcare facilities are congregate living establishments, like skilled nursing facilities, residential healthcare facilities and detention facilities. One infected person in these close living quarters can infect the whole place in a matter of a day or two. If all the residents are COVID-19 free and do not leave the facility, then the real risk is the staff and caregivers who come and go from their own homes. County programs were put in place to test the non-resident workers of these facilities regularly.^[26]

Our Local Response

During the spring of 2020 the pandemic was still very modest in the United States compared to the end of 2020. At a peak in April, over 34,000 cases a day were reported in the US. At the end of July 2020 there was another peak at 70,000 new cases every day and by the first week in January 2021 a peak of nearly 260,000 new cases a day were logged.^[27] California and Santa Cruz County both followed these national patterns.

In spring 2020, our local public health officials, as well as other groups such as the Community Foundation of Santa Cruz County,^[28] Community Health Centers^[29] and researchers and administrators at UCSC,^[25] were concerned that the county would not be prepared if the pandemic developed more rapidly and more intensely. As early as April 10, 2020 the Director of the HSA drafted a call to action to prepare for the more serious phases of the pandemic to come. See [Appendix B](#).

The Lab

Prominent among needs facing the county was for a local fast-turnaround PCR^[30] testing laboratory. UCSC is famous for its DNA research^[31] and its talented scientists^[25] were anxious to work toward developing a COVID-19 test. They felt that they could build a local testing laboratory to return results within 24 to 48 hours when the typical commercial laboratories were taking 4 days or more. Commercial laboratories were suffering from a lack of available resources to conduct the diagnostics concurrent with a demand surge. COVID-19 test results are not useful when they take more than a couple of days.

The UCSC scientists also felt they could develop a testing procedure that would not require chemicals in short supply at most of the nation's testing laboratories.^[32] A UCSC chancellor and dean supported this idea to be able to get fast turn around for specimens from the UCSC Student Health Department as well as helping the underserved in the county. The Community Foundation of Santa Cruz County and the Public Health Division of the Santa Cruz County Health Services Agency supported the laboratory to overcome emergency certification hurdles and by paying for the individual tests.

The UCSC effort culminated on May 1, 2020 when they opened for business processing specimens from the Student Health Center, the two Community Health Centers and Salud Para La Gente.^[33] By July 9, 2020 the PHD had arranged for \$620,906 of CARES Act funds to buy equipment for the laboratory.^[34] The laboratory gradually ramped up its capacity. By August 2020 they planned to be able to process 600-800 specimens per day after using additional PHD CARES Act funds of \$805,049 to purchase more equipment.^{[32] [35]}

The University paid for testing at the Student Health Center. The Community Foundation paid for tests for the Santa Cruz establishments and was reimbursed 80% by the Federal Emergency Management Agency until late fall when the PHD took over making those payments out of the CARES Act funding. With expanded capacity in late

2020, the PHD advanced \$200,000 for testing at detention centers, the East Cliff Family Health Center, all the skilled nursing facilities, and the Homeless People's Health Project.^{[36] [26]}

Creation of the UCSC COVID-19 Laboratory received recognition. Less well known is the amount of financial support arranged by the Health Services Agency and the Community Foundation.

PHD Early Response

In June 2020, the PHD notified their health system and their laboratory partners that they would request funds available from the CARES Act for those partners to buy enhanced testing equipment and supplies.^{[37] [26]}

- Watsonville Community Hospital purchased a Biofire Film Array Torch System and additional testing modules.^[38]
- The HSA Emeline Clinic Laboratory purchased BD Max and Biofire systems.^{[39] [38]}
- As noted above, the UCSC Laboratory bought equipment to establish and expand their testing system.
- Dominican Hospital was able to cover the costs of their own testing equipment.

Testing without a Laboratory

In many cases, laboratory turnaround of one or two days is too long. The pressure for quick testing spurred the development of antigen tests^[30] that could be evaluated on the spot, much like a pregnancy test. Examples of these tests are the Abbott BinaxNow^{[40] [41]} and the Becton Dickenson Veritor.^[42] During October 2020 and November 2020 the PHD purchased 1,000 of these and made them available to detention facilities, to two Federally Qualified Health Centers – Salud Para La Gente and the East Cliff Family Health Center – to all the skilled nursing facilities in the county and to the Homeless People's Health Project.^{[26] [43]}

Later in 2020 the PHD made an additional 1,500 antigen test kits available.^[26] By April 2021, the PHD had delivered over 23,000 kits.^[44] These give test results within 15 minutes and do not require any equipment except the material supplied in a “kit.”^[40] The tests are not as good as the laboratory processed PCR tests but if a person is found positive with a BinaxNOW or Becton Dickenson test they can be re-tested with a PCR test for a more definitive answer.^[45] These “quick” tests augmented the laboratory PCR testing provided at UCSC.

Further, the PHD created websites (also called “kits” but with a different meaning) for skilled nursing and residential healthcare facilities to help them maneuver the complex state and other government requirements instituted to prevent breakouts in such homes.^{[46] [47]}

Limits to Testing Due to Limited Supplies

For the better part of 2020 the CDC recommended diagnostic testing only for those people who:

1. currently have symptoms of COVID-19, or
2. have been in close contact with someone who has tested positive, or
3. were recommended to have a test by a doctor or other health professional.^[48]

During that period the majority of testing in the county was to prevent breakouts.^[49]

Only one site in the county, the Ramsey Park State testing site in Watsonville, circumvented these recommendations. They provided a COVID-19 test for an individual without meeting the restrictive CDC criteria or without being an established patient/member of a healthcare organization. A second state sponsored site was established at the Santa Cruz Civic Center in late December 2020. These state testing sites have enabled more surveillance testing for vulnerable groups.^[50] In 2021 the limits to testing became more relaxed but many sites still required a doctor's referral.^[51]

Asymptomatic Infection

From the early days of the COVID-19 disease in January 2020, there was concern that a person could be infected and infect others without showing symptoms (asymptomatic). Typically a person is infectious a couple of days before showing symptoms but it became clear that some people became infected, had a course of the disease, and never knew it. As many as 40% of those that have been infected were asymptomatic.^{[52] [53]} So, for example, if 10 cases of infection were detected in your community on one day, there could be another 3-4 cases that went undetected. These undetected people make controlling the spread of the virus nearly impossible if people congregate in groups.

Why Test Apparently Healthy People?

There are several reasons why the restrictions on who could get tested have been detrimental to fighting the virus. The only way to find asymptomatic, yet infected, people is to test people that appear healthy. For example, the regular "surveillance" testing in aggregate living facilities has been one path to finding asymptomatic people.^[54]

Routine testing of essential workers, especially those that work in close contact with others, finds asymptomatic infected cases if done often enough.^[55] The Santa Cruz County Jail has had no breakouts of COVID-19 among inmates because of testing staff and inmates alike, and doing contact tracing.^[56] Other local agencies, especially those concerned with underserved communities, urged everyone to go to one of the state sites for testing (Ramsey Park and Santa Cruz Civic Center).^[57]

Contact Tracing

Testing and contact tracing are decades old established public health practices for combating contagious disease breakouts by isolating and treating infected people.^[26]

Contact tracing is a labor intensive activity. Interviewing an infected person to gather contact information and attempting to contact each person they could likely have infected requires skill, patience and time. Testing and tracing is a required element of the CDC's ten essential services needed to promote and protect public health and to which the HSA Public Health Division subscribes.^[58] The numbers of people tested proportional to the population has also been one of the criteria used by the State of California to determine the “color-coded tier” controlling the openness allowed in each county.^[59]

When done early in a breakout, testing and contact tracing can slow or stop the breakout, saving lives and suffering. A breakout can grow to a level where tracing becomes futile. However, as a breakout comes under control, testing and tracing can, again, be an effective means to eliminate the disease entirely.^[60]^[61] Testing is also the primary means to gather statistics for guiding future actions.

Testing and contact tracing are also effective in closed-group situations such as healthcare sites, skilled nursing facilities, assisted living facilities, jails, schools, etc. Success in avoiding a breakout in the County Jail is exemplary.^[56] Regular and frequent testing can assure small groups that they are free of risk to their members and others: groups such as essential workers which must occupy a common indoor space, grocery store employees, farm workers, farmer's market workers, construction crews, etc. See [Appendix A](#).

Reviewing the Actions taken by Santa Cruz County Public Health Division

As was noted in the earlier Background section, the Santa Cruz County Public Health Division (PHD)^[62]^[63] seldom does any testing itself. It is, however, responsible for the general health and well-being of the residents of the county. Assuring the health of the public is incredibly far reaching, involving medical care, education, contagious diseases, water, waste, power, housing, mental health, and more, all in the broadest sense. For example, housing can include homelessness, home sanitation, heat, water, power and overcrowding which impacts residents' health. Normally the PHD has established liaison and cooperation arrangements with many, if not most, of the other agencies within the county government – a huge effort.^[64]

PHD Reacted Early

Responsible for the local public health in Santa Cruz County,^[6] the PHD keeps an eye on possible epidemics and pandemics that could reach our county. As early as December 2019, even before any cases of COVID-19 were diagnosed in the United States, the PHD was following the COVID-19 breakout in China. Our public health department is local but far from parochial.

Early activities included:

- January 5, 2020: The County Health Officer issued an order suspending elective surgeries and elective procedures due to the COVID-19 pandemic to make sure that our healthcare facilities and healthcare workers would be available and prepared for COVID-19 patients.^[65]
- February 28, 2020: The HSA: Department of Operations Crisis Center was activated.^[66]
- March 9, 2020: The Board of Supervisors declared a County Health Emergency which enables the county to be reimbursed for emergency health activities from the state and federal governments.^[26]
- March 16, 2020: The County Health Officer issued a Shelter in Place Order.^[67]
- April 28, 2020: The PHD announced the Save Lives Santa Cruz County campaign.^[66]
- May 1, 2020: The UCSC Molecular Diagnostic Laboratory (later renamed the Colligan Clinical Diagnostic Laboratory) was issued a CLIA license to operate a COVID-19 testing laboratory with support from the Public Health Division and the Community Foundation.^[25]

By March 17, 2020, the county had only 14 diagnosed cases of COVID-19 and no deaths from the disease. The actions listed above were, indeed, very early as:

- On January 21, 2020 the Center for Disease Control and Prevention declared the first COVID-19 case in the United States.^[68]
- On March 6, 2020 the first case of COVID-19 in Santa Cruz County was registered.^[69]
- On March 11, 2020 the World Health Organization declared COVID-19 a pandemic.^[1]
- On March 19, 2020 the Governor of California issued an Executive Order to shelter in place. (Before that, on March 16, 2020 the County Health Officer had already issued a Shelter in Place Order.^[67])

Save Lives Santa Cruz

On April 28, 2020, the Director of the HSA announced an initiative called “Save Lives Santa Cruz County.” It was a multi-agency team drawn from a number of agencies, hospitals, etc. who were charged with designing and implementing plans for a county-wide program to fight the pandemic. This program was modelled after those used to manage natural disasters like wildfires.^{[26] [66] [70] [71] [67]} The team reported to the Incident Commander of the Public Health Division Operations Center (DOC). The team consisted of over 160 people who spent at least part time working on DOC initiatives.

The nine planning objectives for the Save Lives program are:^[66]

- Minimize death and illness from COVID-19;
- Mitigate spread of COVID-19;
- Use an equity lens in all decision making;

- Build community capacity for long-term COVID-19 resiliency;
- Ensure health, safety, and welfare of responders and their families;
- Provide a coordinated response with cooperating, allied, and assisting agencies;
- Provide consistent and accurate guidance to healthcare providers;
- Provide consistent and accurate information to the public; and
- Maintain fiscal responsibility for COVID-19.

The Save Lives program developed operational periods, usually one week long, for which they produced objectives for the upcoming period. Reports from early November 2020 and from April 2021 are available. These period reports contain a “Significant Events” list which includes an impressive summary of the Save Lives Santa Cruz County activities with links to important documents, starting with December 31, 2019. For example, one entry is a reference to a press release from October 29, 2020 noting that the HSA had disbursed \$619,900 of CARES Act funds to organizations supporting the underserved in the county.^{[72][73]}

At least 30 period objectives including some specific to testing and tracing are in those plans and reflect how professional and effective this team has been:

- *provide targeted COVID-19 testing to special needs cases to mitigate COVID-19 spread and to provide consultation and training services for specific settings (assigned to Rapid Response Team).*
- *ensure increased testing capacity, testing volume, and ease of access to address health equity issues by partnering with local organizations/agencies (assigned to Private Testing Partnerships Teams (UCSC and Salud Para La Gente).*
- *provide clinical expertise regarding testing modalities and supply chain issues (assigned to the HSA Clinical Laboratory).*^{[74][66]}

PHD and Contact Tracing

On March 26, 2020, the County Health Officer issued an order that requires the results of all COVID-19 tests to be submitted to state public health officials using the California Reportable Disease Information Exchange (CalREDIE) system.^[9] The cases are then transmitted to the state website CalCONNECT for investigation and tracing.^[26] The Health Officer’s Order includes this sentence: “By sharing high quality test result data at scale, state and local health authorities can better track COVID-19, predict its spread, and better focus public resources to end this global pandemic.”^[9]

The reports submitted to CalCONNECT include the identification and contact information for the persons tested. PHD case managers have been accessing the CalCONNECT system daily to start management for positive cases found in the county. They assign trained contact tracers to each positive case within 24 hours of when the test was entered into CalCONNECT.

By now we are all familiar with the “exponential” growth phenomena where one person infects two who each infect two, who each infect two and the total numbers infected reaches very high levels in a relatively small number of cycles. The number two is not

special and even greater numbers expand the growth dramatically. This is how epidemics and pandemics happen. Stopping an infected person from infecting others is the key way to break this growth.

Each person who performs contact tracing needs to go through a 20-hour state online training class that typically takes a full week to complete. Additionally, contact tracers are taught to use the online platform CalCONNECT to input their data.^[26]

It was reported that in the summer of 2020 the county had 40 tracers available, growing to 80 in December 2020. On average, one case consumes eight hours of a contact tracer’s time.^[26] The number of cases of COVID-19 reported in the county is shown in the graph provided in [Appendix C](#). A sketch of the number of cases assigned to contact tracers is shown in Table 1.

Table 1. Number of Cases Assigned to Contact Tracers^[27]

In 2020, From	In 2020, To	Average Daily Cases	Remarks	Cumulative total at end of period
March 6	March 6	1	single day	1
March 17	March 17	13	single day	14
March 23	June 23	4	period peak day: 12	295
June 23	August 31	21	10 days over 40	1,760
September 1	October 31	19	5 days over 40	2,887
November 1	December 31	95	30 days over 100	8,747

These figures show that 40 contact tracers could handle the load during the summer of 2020 up to about the beginning of November 2020. The tracers were not expected to work 24/7 and there were short periods where the numbers exceeded the tracers available but overall tracing was happening close to 100%.

As the number of trained tracers in the county grew to 80 in December, they were beginning to get overwhelmed by the number of reported cases. In addition to the county employees already working on contact tracing, area residents were urged to join the Volunteer Initiative Program.^[10] There are practical limits to how many tracers can be hired and trained. In December the county reached those limits but their goal was still to do contact tracing on 100% of the cases reported. They prioritized cases in congregate settings.^[26] More details on tracing can be found in the Save Lives Period 62 Report.^[75]

COVID-19 Does Not Fit The Model

The ideal scenario for diagnostic testing and contact tracing to prevent breakouts of COVID-19 would be:

1. A person's symptoms are so severe that they visit their personal healthcare facility within a day or two of the onset of symptoms.
2. The healthcare professional takes a specimen from the person and expresses it to a laboratory for testing for COVID-19.
3. The laboratory notifies the healthcare worker of the test results within one or two days.^{[33] [76]}
4. The healthcare professional logs the patient's personal identification information and contact information into a government database together with the results of the test.
5. A case worker who watches the government database picks up this case within one day if the test results were positive.
6. The case worker immediately assigns this case to a trained contact tracer.
7. The original healthcare worker treats the infected person by either prescribing stay at home or care in a hospital.^[26]

In this scenario, the infected person is definitively determined to be infected, or not, in approximately five days from their original infection. The healthcare worker will have advised them to take precautions to avoid infecting other people until the test results are known, lest they test positive.

Unfortunately, the COVID-19 disease does not fit the above model very well.

1. Not all infected people seek professional attention; approximately 40% have no symptoms at all – the “asymptomatic” ones.
2. Only some of the infected people that do feel sick, feel bad enough to seek medical help.
3. COVID-19 transmission from person to person is very high, especially in poorly ventilated spaces.
4. People can infect others for about 10-14 days while they are infected.
5. The turnaround time for just the laboratory results can be more than four days. The time from when a person gets infected until they are notified that they tested positive can be as long as 10 days and they may not even be infectious by the time the results are received.^[26]

These difficulties mean testing and contact tracing do not work as well with COVID-19 as they might. Nonetheless, testing and contact tracing still save lives by preventing infected persons from infecting others. They also allow people to get early treatment.

The slow turnaround when shipping specimens to laboratories was mitigated in the county by:

- making sure hospitals had the equipment to do their own tests,
- getting a local fast-turnaround laboratory established at UCSC and
- delivering nearly 3,000 results-in-house tests for the congregate facilities.^[26]

The difficulties that COVID-19 presents for testing and tracing emphasize how important it is for people to wear masks and socially distance.^[77]

Santa Cruz Did Well

The state has tracked COVID-19 data county-by-county and makes that data available through a website.^[78] Santa Cruz County has done much better than most other counties in the state according to data extracted from this website on April 30, 2021.

Santa Cruz County is a beach destination for people outside the county on weekends, holidays and for vacations. At those times, the population swells well beyond the permanent resident count used for reporting cases per 100,000 population. The objective of stay-at-home orders is to slow the movement and mingling of people. Santa Cruz might have done worse than most other counties in the state – *instead, Table 2 shows it had one of the best records.*

Table 2. California COVID-19 Data by County, March 1, 2020 through April 30, 2021^[78]

Measure	Santa Cruz County	Range for All Counties	n th Best of 58
Cases/100K	5,825	4,650 up to 17,096	20 th
Deaths/100K	95	0 up to 376	26 th
Test logged/100K	534	80 up to 1,248	11 th
Testing Positivity Rate	0.6%	0.0% up to 9.6%	7 th

Santa Cruz County did not have its 10th COVID-19 death until 9/16/2020. Santa Cruz County did really well at testing compared to all other counties in the state.

Freedom and Money

The County Health Officer’s stay-at-home order impinged on some residents’ sense of *freedom*. They disrupted a Board of Supervisors’ meeting where the County Health Officer attended, prompting the Sheriff to tell her not to come to any more Board meetings in person because he could not guarantee her safety. People protested outside her private residence and at the home of the Director of HSA, making both very concerned for their own and their family’s safety. They received threats via email as well.^{[79] [80] [81]}

The Health Officer's orders to close the Santa Cruz beaches and curtail surfing were also met with opposition. A nice beach day attracts hundreds of out-of-county people who spend money in the county. People opposed to the beach closings felt that there must be some other way to keep people isolated without impacting the county's economy. Of course, the issue of asking people to stay home versus keeping the economy running has also been a national issue.

Public Information

As early as May 2020 the HSA "Save Lives Santa Cruz County: *Get Tested*" webpage^[82] listed sites where testing was taking place. A typical entry on the webpage list:

Santa Cruz Community Health Centers
21507 E Cliff Drive
Santa Cruz, CA 95062
Mon-Thurs 8am – 8 pm,
Fri 8am – 4 pm
831-427-3500

On May 23, 2020 there were 13 sites listed which grew to 18 in spring 2021. As of May 2021, the information provided in these entries is inadequate to determine where to get tested. Each person has their own special requirements (as listed below) and has no way of matching them with the listed testing sites' capabilities. The HSA website needs to inform people that each site has different rules and tests offered that may or may not match their needs.

The abilities and rules of each testing site are varied and include options like:

- Drive through
- PCR Test
- Antibody Test
- Immediate turnaround
- No prescription needed
- No insurance required
- No charge
- Turnaround <2 days
- At home mail-in
- Walk-in

Read [Appendix D](#) to understand the complexity of getting a "free" COVID-19 test if you have no symptoms and have not been exposed.

Some sites charge for the tests even though the federal government will generally pay for them.^[83] Throughout 2020 and even leading into 2021, because of CDC rules in place at that time, nearly all of the testing sites would only test symptomatic people or those clearly experiencing some COVID-19 exposure.^[48] Throughout 2021 those restrictions have been relaxed because testing supplies are more available.^[84]

Antibody tests,^[45] that test for antibodies in a person's blood, can determine if the person was ever infected whereas the more common PCR tests only determine if the person is *currently* infected. The antibody tests became more available in 2021 and there is no mention of that kind of test on any HSA web page. These tests will be used to determine if a vaccination failed. A person, not vaccinated, can also determine if they are immune because of a previous asymptomatic illness they didn't know they had. There are millions of those people.

More Publicity and Visibility

The Grand Jury spent many hours doing searches for information to develop this report. More transparency on the part of Santa Cruz County would have been very helpful. For example, the PHD became a conduit to bring federal CARES money to the county to buy equipment and supplies. We found no publicity about this and believe that county residents would be happy to hear of some of their federal income taxes returning to the county. A significant example that lacks that kind of publicity is the establishment of the COVID-19 testing laboratory at UCSC^[85]^[35] where PHD directed over \$1.5M from the CARES funding.

Conclusion

We found that the Public Health officials in the county government are experienced professionals who met high expectations and, acting early and wisely, did mitigate the consequences of the COVID-19 pandemic by promoting testing and tracing in Santa Cruz County. The county instituted a pandemic crisis management initiative called "Save Lives Santa Cruz County," much like a crisis center established during a wildfire to coordinate the effort of the wide range of agencies each independently doing their part to blunt the effects of the pandemic.

Findings

- F1.** The Health Services Agency of Santa Cruz County's web page listing COVID-19 testing sites does not adequately help residents find an appropriate testing site to fit their needs.
- F2.** The Health Services Agency of Santa Cruz County's Save Lives Santa Cruz County webpages do not adequately publicize and inform the public of the critical work that is being done, nor do they reflect the crisis the county has gone through.
- F3.** Establishing the COVID-19 testing laboratory at University of California at Santa Cruz is a great example of cooperation among the university and public agencies in the county. The laboratory has received considerable attention but the cooperative effort among the County Public Health Division, Community Foundation of Santa Cruz County and UCSC has not.

F4. The Santa Cruz County Public Health Division is staffed by well trained, skilled and knowledgeable professionals who applied that talent to help protect the residents of Santa Cruz County during the COVID-19 pandemic.

Recommendations

- R1.** Within the next 3 months the Health Services Agency of Santa Cruz County should revise its web pages to help people find a testing site suitable to their requirements. Listing sites without characterizations is not sufficient. (F1)
- R2.** Within the next 3 months the Health Services Agency of Santa Cruz County should publicize the Save Lives Santa Cruz initiative beyond what is currently on their website. For example, they should publish the Save Lives weekly operational review for the public to see the behind the scenes work that is happening. (F2)
- R3.** Within the next 3 months the Health Services Agency of Santa Cruz County should prepare weekly highlights from the Save Lives periodic reports for public consumption. (F2, F4)
- R4.** Within the next 3 months the Health Services Agency of Santa Cruz County should provide a regularly scheduled and recorded video report available to the public on the county website. (F2, F4)
- R5.** Within the next 3 months the Health Service Agency of Santa Cruz County should create a press release detailing the support that was provided for the UCSC Laboratory. (F3)

Commendations

- C1.** The Public Health officials in Santa Cruz County reacted early and effectively to reduce the impact of the COVID-19 pandemic. The professionals were well prepared to respond quickly. (F4)
- C2.** The University of California at Santa Cruz Molecular Diagnostic Laboratory established a COVID-19 testing facility to make short turnaround testing available for the underserved in Santa Cruz County. (F3)
- C3.** The Santa Cruz Community Foundation and the Santa Cruz County Public Health Division teamed with the UCSC Molecular Diagnostic Laboratory to establish a commercial COVID-19 testing laboratory and provided funding and advice. (F3)

Required Responses

<i>Respondent</i>	<i>Findings</i>	<i>Recommendations</i>	<i>Respond Within/ Respond By</i>
Santa Cruz County Board of Supervisors	F1–F4	R1–R5	90 days/ August 31, 2021

Invited Responses

<i>Respondent</i>	<i>Findings</i>	<i>Recommendations</i>	<i>Respond Within/ Respond By</i>
Director, Health Services Agency of Santa Cruz County	F1–F4	R1–R5	90 days/ August 31, 2021
Public Information Officer of Save Lives Santa Cruz	F1–F4	R1–R5	90 days/ August 31, 2021
Communication Manager of Santa Cruz County	F1–F4	R1–R5	90 days/ August 31, 2021

Definitions

- **CaCONNECT:** A California State website for collecting COVID-19 investigation and tracing information
- **CaREDIE:** California Reportable Disease Information Exchange
- **CARES:** Coronavirus Aid, Relief, and Economic Security (Act), enacted by the U.S. Congress
- **CCDL:** Colligan Clinical Diagnostic Laboratory at UCSC
- **CDC:** Center for Disease Control and Prevention (of the Public Health Service of the U.S. Department of Health and Human Services)
- **CDPH:** California Department of Public Health
- **CLIA:** Clinical Laboratory Improvement Amendments
- **CMS:** Centers for Medicare & Medicaid Services (of the U.S. Department of Health and Human Services)
- **COVID-19:** Name officially given to the disease causing the pandemic by the International Classification of Diseases of the World Health Organization
- **DNA:** Deoxyribonucleic Acid, a molecule that contains the genetic instructions for an organism
- **EUA:** Emergency Use Authorization, an authorization issued by the FDA to allow the use of medical equipment and processes in the U.S.
- **FDA: U.S.** Food and Drug Administration (of the Public Health Service of the U.S. Department of Health and Human Services)
- **FEMA:** Federal Emergency Management Agency
- **GJ:** Grand Jury
- **HSA:** Health Services Agency (of Santa Cruz County)
- **ICD:** International Classification of Diseases of the World Health Organization

- **ICTV:** International Committee on Taxonomy of Viruses
- **LHJ:** Local Health Jurisdiction, provides public health services throughout a defined geographic area
- **MDL:** Molecular Diagnostic Laboratory at UCSC, later renamed as the Colligan Clinical Diagnostic Laboratory
- **PAMF:** Palo Alto Medical Foundation, a subsidiary of Sutter Health
- **PCR:** Polymerase Chain Reaction, a kind of test used to detect the SARS-CoV-2 virus
- **PHD:** Public Health Division (of HSA)
- **RCF:** Residential Care Facility
- **RHF:** Residential Healthcare Facility
- **RNA:** Ribonucleic Acid, in some viruses RNA rather than DNA carries the genetic information
- **RT-PCR:** Reverse Transcription Polymerase Chain Reaction, a kind of test used to detect the SARS-CoV-2 virus
- **SARS-CoV-2:** Name officially given to the virus that causes COVID-19 by the International Committee on Taxonomy of Viruses
- **SNF:** Skilled Nursing Facility
- **UCSC:** University of California at Santa Cruz
- **WHO:** World Health Organization

Sources

References

1. World Health Organization. March 11, 2020. "WHO Director-General's opening remarks at the media briefing on COVID-19." Accessed April 2, 2021. <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>
2. National Institute of Health. September 4, 2020. "National Institute on Aging: Why COVID-19 Testing is the Key to Getting Back to Normal—bullet #1." Accessed May 1, 2021. <https://www.nia.nih.gov/news/why-covid-19-testing-key-getting-back-normal>
3. World Health Organization. March 16, 2020. "Director-General's opening remarks at the media briefing on COVID-19—sentence 13: 'We have a simple message for all countries: test, test, test.'" Accessed May 1, 2021. <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---16-march-2020>

4. The Guardian. March 16, 2020. "Test, test, test: WHO calls for more coronavirus testing – video." Accessed May 3, 2021.
<https://www.theguardian.com/world/video/2020/mar/16/test-test-test-who-calls-for-more-coronavirus-testing-video>
5. Santa Cruz County Health Services Agency. September 2020. "HSA's Mission, Vision, & Values. Including the 2025 Strategic Plan." Accessed May 1, 2021.
<https://www.santacruzhealth.org/HSAHome/HSAMission.aspx>
6. Easy Law Lookup. No date provided. "Part 3: Local Health Departments." Accessed May 24, 2021.
https://www.easylawlookup.com/California-Law/Health-and-Safety-Code/par-53289/_easylookup.blp?GO=Prepare&site=easy&print=&data=health&p_start=2422&p_end=2435&p_para=53289&p_epara=53544&par=53289&displayer=YES
7. City of Santa Monica. April 26, 2013. "Authorities and Responsibilities of Local Health Officers in Disasters–smgov.net–California Legal Codes Referenced." Accessed May 1, 2021.
<https://www.smgov.net/departments/oem/sems/proclamations-and-declarations/authorities-and-responsibilities-of-local-health-officers-in-disasters.pdf>
8. Centers for Medicare & Medicaid Services. March 9, 2021. "Clinical Laboratory Improvement Amendments (CLIA)." Accessed May 1, 2021.
<https://www.cms.gov/regulations-and-guidance/legislation/clia>
9. Santa Cruz County Health Services Agency. March 26, 2020. "Order of the Health Officer – No. C19-10: "Order of the Health Officer of the County of Santa Cruz directing all laboratories conducting COVID-19 diagnostic tests to report COVID-19 test information - including positive, negative, and inconclusive test results-to local and State public health authorities." Accessed May 1, 2021.
<http://www.santacruzhealth.org/Portals/7/Pdfs/Coronavirus/20200325%20Order%20-%20Labs.pdf>
10. Santa Cruz Volunteer Initiative Program. No date provided. Accessed May 2, 2021.
<http://scvolunteercenter.org/programs/volunteer-initiative-program/>
11. U.S. Center for Disease Control and Prevention. General website. Accessed May 1, 2021.
<https://www.cdc.gov>
12. U.S. Federal Drug Administration. No date provided. General website. Accessed May 1, 2021.
<https://www.fda.gov>
13. U.S. Federal Emergency Management Agency. No date provided. General website. Accessed May 1, 2021.
<https://www.fema.gov>

14. California Department of Public Health. No date provided. General website. Accessed May 1, 2021.
<https://www.cdph.ca.gov>
15. Missouri Department of Health and Senior Services. October 2002. "Strengthening Missouri's Public Health System – For 2002 and Beyond." Accessed April 11, 2021.
<https://health.mo.gov/living/lpha/pdf/strengthph.pdf>
16. The Washington Post. December 26, 2020. "The CDC's failed race against COVID-19: A threat underestimated and a test overcomplicated." Accessed April 11, 2021.
https://www.washingtonpost.com/investigations/cdc-covid/2020/12/25/c2b418ae-4206-11eb-8db8-395dedaaa036_story.html
17. The Washington Post. April 18, 2020 at 8:00 a.m. PDT. "Contamination at CDC lab delayed rollout of coronavirus tests." Accessed May 1, 2021.
https://www.washingtonpost.com/investigations/contamination-at-cdc-lab-delayed-rollout-of-coronavirus-tests/2020/04/18/fd7d3824-7139-11ea-aa80-c2470c6b2034_story.html
18. World Health Organization. February 11, 2020. "Naming the virus and the disease and the virus that caused it." Accessed May 1, 2021.
[https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-\(covid-2019\)-and-the-virus-that-causes-it](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it)
19. Center for Disease Control and Prevention. November 15, 2018. "Introduction to Public Health Laboratories—Slide presentation." Accessed May 1, 2021.
<https://www.cdc.gov/training/publichealth101/laboratories.html>
20. World Health Organization. June 29, 2020. "Listings of WHO's response to COVID-19. A timeline including January 13, 2020 release of test recipe." Accessed May 1, 2021.
<https://www.who.int/news/item/29-06-2020-covidtimeline>
21. U.S. Food and Drug Administration. February 4, 2020. "FDA Takes Significant Step in Coronavirus Response Efforts, Issues Emergency Use Authorization for the First 2019 Novel Coronavirus Diagnostic (for the CDC)." Accessed May 1, 2021.
<https://www.fda.gov/news-events/press-announcements/fda-takes-significant-step-coronavirus-response-efforts-issues-emergency-use-authorization-first>
22. New York Times. March 10, 2020. "'It's Just Everywhere Already': How Delays in Testing Set Back the U.S. Coronavirus Response." Accessed May 2, 2021.
<https://www.nytimes.com/2020/03/10/us/coronavirus-testing-delays.html>
23. Forbes. April 19, 2020. "Coronavirus: How CDC Lab Contamination, And A Failure To Cooperate Globally, Led To Catastrophe" Accessed May 1, 2021.
<https://www.forbes.com/sites/anitabartholomew/2020/04/19/coronavirus-how-cdc-lab-contamination-and-a-failure-to-cooperate-globally-led-to-catastrophe/?sh=39f742f85f0b>

24. U.S. Food and Drug Administration. April 23, 2021. "Emergency Use Authorization." Accessed May 1, 2021.
<https://www.fda.gov/emergency-preparedness-and-response/mcm-legal-regulatory-and-policy-framework/emergency-use-authorization>
25. University of California at Santa Cruz. No date provided. "The UCSC Molecular Diagnostic Laboratory–Colligan Clinical Diagnostic Laboratory." Accessed May 1, 2021.
https://molecular-diagnostics-lab.ucsc.edu/about_1
26. Grand Jury Interview.
27. New York Times. May 24, 2021. "Coronavirus in the U.S.: Latest Map and Case Count." Accessed May 1, 2021.
<https://www.nytimes.com/interactive/2021/us/covid-cases.html>
28. Community Foundation of Santa Cruz County. No date provided. General website. Accessed May 1, 2021.
<https://www.cfsc.org>
29. Santa Cruz Community Health Centers. No date provided. General website. Accessed May 1, 2021.
<https://www.schealthcenters.org>
30. Mayo Clinic. May 6, 2021. "COVID-19 diagnostic testing." Accessed May 1, 2021.
[https://www.mayoclinic.org/tests-procedures/covid-19-diagnostic-test/about/pac-20488900#:~:text=Also%20called%20a%20molecular%20test,reaction%20\(PCR\).](https://www.mayoclinic.org/tests-procedures/covid-19-diagnostic-test/about/pac-20488900#:~:text=Also%20called%20a%20molecular%20test,reaction%20(PCR).)
31. University of California at Santa Cruz Genomics Institute. No date provided. General website. Accessed May 1, 2021.
<https://ucscgenomics.soe.ucsc.edu>
32. University of California at Santa Cruz Newscenter. August 07, 2020. "County, UCSC partner to expand local testing capacity." Accessed May 1, 2021.
<https://news.ucsc.edu/2020/08/campus-county-partnership.html>
33. University of California at Santa Cruz–News Center. April 27, 2020. "UC Santa Cruz diagnostic lab to begin coronavirus testing May 1." Accessed May 1, 2021.
<https://news.ucsc.edu/2020/04/coronavirus-testing.html>
34. Santa Cruz County. July 9, 2020. "UCSC Testing Equipment Costs Expenditures to Date and Estimated Costs to Meet Santa Cruz County Anticipated Capacity." Accessed May 13, 2021.
http://www.co.santa-cruz.ca.us/Portals/0/County/GrandJury/GJ2021_final/1_TestAndTrace_UCSC.pdf

35. Santa Cruz County. Approved June 30, 2020. Board of Supervisors Agenda Item DOC-2020-591: “Approve revenue agreement with the Community Foundation Santa Cruz County, in the amount of \$1,500,000, for public health COVID-19 response efforts; adopt resolution accepting unanticipated revenue in the amount of \$1,500,000; and take related actions, as recommended by the Director of Health Services.” Accessed May 13, 2021.
https://santacruzcountyca.igm2.com/Citizens/Detail_LegiFile.aspx?Frame=&MeetingID=1811&MediaPosition=0.000&ID=9202&CssClass=
36. Santa Cruz County Health Services Agency. No date provided. “Homeless Persons’ Health Project.” Accessed May 1, 2021.
<http://www.santacruzhealth.org/HSAHome/HSADivisions/ClinicServices/HomelessPersonsHealthProject.aspx>
37. U.S. Department of the Treasury. No date provided. “Coronavirus Relief Fund (CARES Act).” Accessed May 2, 2021.
<https://home.treasury.gov/policy-issues/coronavirus/assistance-for-state-local-and-tribal-governments/coronavirus-relief-fund>
38. Biofire Diagnostics. No date provided. “Biofire FilmArray Torch System.” Accessed May 2, 2021.
<https://www.biofire.com/products/filmarray/>
39. BD Diagnostic Systems. No date provided. “BD Max System.” Accessed May 2, 2021.
<https://moleculardiagnosics.bd.com/bd-max-system/>
40. Reuters. August 26, 2020. “Abbott wins U.S. authorization for \$5 rapid COVID-19 antigen test.” Accessed May 2, 2021.
<https://www.reuters.com/article/us-health-coronavirus-abbott/abbott-wins-u-s-authorization-for-5-rapid-covid-19-antigen-test-idUSKBN25M2WE?>
41. Abbott. No date provided. “BinaxNOW COVID-19 Ag Card.” Accessed May 2, 2021.
<https://www.globalpointofcare.abbott/en/product-details/navica-binaxnow-covid-19-us.html>
42. Becton Dickenson. No date provided. “BD Veritor™ Plus System.” Accessed May 2, 2021.
<https://bdveritor.bd.com/en-us>
43. Santa Cruz County Health Services Agency. November 19–December 3, 2020. “Save Lives Action Plan, Period 52,” pg 8. Accessed May 20, 2021.
http://www.co.santa-cruz.ca.us/Portals/0/County/GrandJury/GJ2021_final/1_TestAndTrace_OP52.pdf#page=9
44. Santa Cruz County Health Services Agency. April 1–15, 2021. “Save Lives Action Plan, Period 62,” pg 10. Accessed May 20, 2021.
http://www.co.santa-cruz.ca.us/Portals/0/County/GrandJury/GJ2021_final/1_TestAndTrace_OP62.pdf#page=11

45. Center for Disease Control and Prevention. Updated March 17, 2021. "Overview of Testing for SARS-CoV-2 (COVID-19)." Accessed April 11, 2021.
<https://www.cdc.gov/coronavirus/2019-ncov/hcp/testing-overview.html>
46. Santa Cruz County Health Services Agency. No date provided. "Skilled Nursing Facility (SNF) COVID-19 Testing Toolkit." Accessed May 2, 2021.
[https://www.santacruzhealth.org/HSAHome/HSADivisions/PublicHealth/CommunityDiseaseControl/CoronavirusHome/PublicInformation/SkilledNursingFacility\(SNF\)COVID-19TestingToolkit.aspx](https://www.santacruzhealth.org/HSAHome/HSADivisions/PublicHealth/CommunityDiseaseControl/CoronavirusHome/PublicInformation/SkilledNursingFacility(SNF)COVID-19TestingToolkit.aspx)
47. Santa Cruz County Health Services Agency: No date provided. "COVID-19 Testing Toolkit for Residential Care Facilities." Accessed May 2, 2021.
<https://www.santacruzhealth.org/HSAHome/HSADivisions/PublicHealth/CommunityDiseaseControl/CoronavirusHome/PublicInformation/COVID-19TestingToolkitforResidentialCareFacilities.aspx>
48. Center for Disease Control and Prevention. March 18, 2021. "Test for Current Infection (Viral Test)." Accessed May 2, 2021,
<https://www.cdc.gov/coronavirus/2019-ncov/testing/diagnostic-testing.html#who-should-get-tested>
49. Health Affairs. March 23, 2020. "Saving COVID-19 Testing For Those Who Really Need It." Accessed May 2, 2021.
<https://www.healthaffairs.org/doi/10.1377/hblog20200320.954911/full/>
50. California COVID-19 Testing Task Force. August 26, 2020. "Governor Newsom Announces Major Plan to More than Double State's Testing Capacity, Reduce Turnaround Time." Accessed May 2, 2021.
<https://testing.covid19.ca.gov/2020/08/26/governor-newsom-announces-major-plan-to-more-than-double-states-testing-capacity-reduce-turnaround-time/>
51. Santa Cruz Local. April 10, 2021. Map: COVID-19 test sites in Santa Cruz County. Accessed May 24, 2021.
<https://santacruzlocal.org/2021/04/01/covid-test/#watsduty>
52. New York Times. August 6, 2020. "Even Asymptomatic People Carry the Coronavirus in High Amounts." Accessed May 2, 2021.
<https://www.nytimes.com/2020/08/06/health/coronavirus-asymptomatic-transmission.html>
53. UC Health Today (Colorado). November 5, 2020. "The truth about COVID-19 and asymptomatic spread: It's common, so wear a mask and avoid large gatherings." Accessed May 2, 2021.
<https://www.uchealth.org/today/the-truth-about-asymptomatic-spread-of-covid-19/>
54. U.S. Center for Disease Control and Prevention. June 2020. "Facility-Wide Testing for SARS-CoV-2 in Nursing Homes—Seven U.S. Jurisdictions."
<https://www.cdc.gov/coronavirus/2019-ncov/hcp/nursing-homes-testing.html>

55. University of California at Berkeley University Health Services. No date provided. "Campus Community Screening (Surveillance Testing)." Accessed May 2, 2021. <https://uhs.berkeley.edu/coronavirus/testing-covid-19/campus-surveillance-testing>
56. Santa Cruz Sentinel. December 4, 2020. "COVID-19 outbreak bypasses Santa Cruz County jail inmates." Accessed May 2, 2021. <https://www.santacruzsentinel.com/2020/12/04/covid-19-outbreak-bypasses-santa-cruz-county-jail-inmates/>
57. Santa Cruz Local. May 22, 2020. "Essential workers told to get COVID tests in Santa Cruz County." Accessed May 2, 2021. <https://santacruzlocal.org/2020/05/12/essential-workers-told-to-get-covid-tests-in-santa-cruz-county>
58. Center for Disease Control and Prevention. Revised 2020. "10 Essential Public Health Services." Accessed May 2, 2021. <https://www.cdc.gov/publichealthgateway/publichealthservices/essentialhealthservices.html>
59. California Department of Public Health. May 24, 2021. "California Blueprint for a Safer Economy—Health Metric Rating for Counties in CA." Accessed May 2, 2021. <https://covid19.ca.gov/safer-economy/>
60. Center for Disease Control and Prevention. September 11, 1998. "Morbidity and Mortality Weekly Report: Preventing Emerging Infectious Diseases – A Strategy for the 21st Century," Vol. 47, No. RR-15, pg 5. Accessed April 11, 2021. <https://www.cdc.gov/mmwr/pdf/rr/rr4715.pdf#page=9>
61. Center for Disease Control and Prevention. Updated February 18, 2021. "Interim Guidance on Developing a COVID-19 Case Investigation & Contact Tracing Plan: Overview." Accessed April 11, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/overview.html>
62. Santa Cruz County Health Services Agency—Public Health Division (Department). No date provided. General website. Accessed May 2, 2021. <http://www.santacruzhealth.org/HSAHome/HSADivisions/PublicHealth.aspx>
63. Santa Cruz County Health Services Agency, Divisions. No date provided. General website. Accessed May 2, 2021. <http://www.santacruzhealth.org/HSAHome/HSADivisions.aspx>
64. Santa Cruz County Departments. No date provided. General website. Accessed May 2, 2021. <https://www.santacruzcounty.us/Departments.aspx>

65. Santa Cruz County Health Services Agency. January 5, 2020. "Order of the Health Officer of the County of Santa Cruz Suspending Elective Surgeries and Elective Procedures Due to the COVID-19 Pandemic." Accessed April 11, 2021. <https://www.santacruzhealth.org/Portals/7/Pdfs/Coronavirus/PHO%20Order%20Elective%20Surgeries%20and%20Procedures%20Jan%205%202021.pdf>
66. Santa Cruz County Health Services Agency. April 1–15, 2021. "Save Lives Action Plan, Period 62." Accessed May 20, 2021. http://www.co.santa-cruz.ca.us/Portals/0/County/GrandJury/GJ2021_final/1_TestAndTrace_OP62.pdf
67. Santa Cruz County Health Services Agency. March 31, 2020. "Order Of The Health Officer of the County of Santa Cruz Directing All Individuals Living in the County to Continue Sheltering at Their Place of Residence Through May 3, 2020." Accessed May 2, 2021. <http://www.santacruzhealth.org/Portals/7/Pdfs/Coronavirus/PHO%20Order%20Extending%20SIP%2020200331.pdf>
68. U.S. Center for Disease Control and Prevention: January 21, 2020. "First Travel-related Case of 2019 Novel Coronavirus Detected in the United States." Accessed May 2, 2021. <https://www.cdc.gov/media/releases/2020/p0121-novel-coronavirus-travel-case.html>
69. Santa Cruz Sentinel. March 7, 2020. "First case of coronavirus reported in Santa Cruz County". Accessed May 2, 2021. <https://www.santacruzsentinel.com/2020/03/07/first-case-of-coronavirus-reported-in-santa-cruz-county/>
70. Santa Cruz County Health Services Agency. No date provided. "Save Lives Santa Cruz County." Accessed April 11, 2021. <http://www.santacruzhealth.org/HSAHome/HSADivisions/PublicHealth/CommunicableDiseaseControl/CoronavirusHome/SAVELivesSantaCruzCounty.aspx>
71. Save Lives Santa Cruz. April 28, 2020. "Presentation to the County Board of Supervisors by Director Mimi Hall." Accessed May 2, 2021. <https://www.youtube.com/watch?v=K4BWNB5ZP5M>
72. Santa Cruz County Health Services Agency Press Release. October 29, 2020. "County Awards \$619,900 In Cares Act Health Equity Grants." Accessed May 14, 2021. <https://www.santacruzhealth.org/Portals/7/Pdfs/Coronavirus/Health%20Equity%20Grant%20Awards%20102920.pdf>
73. Santa Cruz County Health Services Agency. April 1–15, 2021. "Save Lives Action Plan, Period 62," pg 10. Accessed May 20, 2021. http://www.co.santa-cruz.ca.us/Portals/0/County/GrandJury/GJ2021_final/1_TestAndTrace_OP62.pdf#page=11

74. Santa Cruz County Health Services Agency. November 19–December 3, 2020. “Save Lives Action Plan, Period 52.” Accessed May 20, 2021.
http://www.co.santa-cruz.ca.us/Portals/0/County/GrandJury/GJ2021_final/1_TestAndTrace_OP52.pdf
75. Santa Cruz County Health Services Agency. April 1–15, 2021. “Save Lives Action Plan, Period 62,” pg 8. Accessed May 20, 2021.
http://www.co.santa-cruz.ca.us/Portals/0/County/GrandJury/GJ2021_final/1_TestAndTrace_OP62.pdf#page=9
76. University of California at Santa Cruz (You Tube). May 22, 2020. “Marm Kilpatrick COVID-19 seminar: at 40 minutes.”
<https://www.youtube.com/watch?v=THiqs-1a9z0?t=2356>
77. Center for Disease Control and Prevention. March 19, 2021. “COVID-19 Pandemic Planning Scenarios.” Accessed May 2, 2021.
<https://www.cdc.gov/coronavirus/2019-ncov/hcp/planning-scenarios.html>
78. State of California Department of Technology. No date provided. “COVID-19: California Case Statistics–selection of search topic at upper right.” Accessed April 30, 2021.
https://public.tableau.com/profile/ca.open.data#!/vizhome/COVID-19CasesDashboardv2_0/CaseStatistics
79. New York Times. August 10, 2020. “An Interview With the Health Officer for Santa Cruz.” Accessed May 2, 2021.
<https://www.nytimes.com/2020/08/10/us/california-santa-cruz-covid19.html>
80. Lookout Santa Cruz. April 24, 2021. “County Health officials Newel and Hall subject of revealing ‘This American Life’ about harassment, safety.” Accessed May 2, 2021.
<https://lookout.co/santacruz/coronavirus/covid-today/story/2021-04-24/this-american-life-mimi-hall-gail-newel>
81. Santa Cruz Sentinel. April 29, 2021. “Santa Cruz County health officer thanks community for rallying around her.” Accessed May 2, 2021.
https://www.santacruzsentinel.com/2021/04/29/santa-cruz-county-health-officer-thanks-community-for-rallying-around-her/?utm_email=D5C28499E4D36468F4D7E43FDE&g2i_eui=sFjQ5Jfx0CAaP%2bdtnApuBR2mqazfizK8&g2i_source=newsletter&utm_source=litrak&utm_medium=email&utm_term=https%3a%2f%2fwww.santacruzsentinel.com%2f2021%2f04%2f29%2fsanta-cruz-county-health-officer-thanks-community-for-rallying-around-her%2f&utm_campaign=norcal-santa-cruz-morning-report&utm_content=curated
82. Santa Cruz County Health Services Agency. “Santa Cruz Save Lives: Get Tested.” Accessed on May 2, 2021.
<https://www.santacruzhealth.org/HSAHome/HSADivisions/PublicHealth/CommunicableDiseaseControl/CoronavirusHome/SAVELivesSantaCruzCounty/GetTested.aspx>

83. U.S. Department of Health and Human Services. March 16, 2021. "Community-Based Testing Sites for COVID-19." Accessed May 2, 2021. <https://www.hhs.gov/coronavirus/community-based-testing-sites/index.html#:~:text=COVID%2D19%20tests%20are.available%20in%20your%20area>
84. American Society for Microbiology. January 19, 2021. "Supply Shortages Impacting COVID-19 and Non-COVID Testing." Accessed May 12, 2021. <https://asm.org/Articles/2020/September/Clinical-Microbiology-Supply-Shortage-Collecti-1>
85. USCS Colligan Clinical Diagnostic Laboratory—Originally known as the Molecular Diagnostics Laboratory. No date provided. Accessed May 2, 2021. <https://molecular-diagnostics-lab.ucsc.edu>
86. U.S. Food and Drug Administration. No date provided. "Coronavirus Disease 2019 Testing Basics." Accessed May 3, 2021. <https://www.fda.gov/consumers/consumer-updates/coronavirus-disease-2019-testing-basics>
87. U.S. Food and Drug Administration. April 13, 2021. "Coronavirus (COVID-19) Update." Accessed May 3, 2021. <https://www.fda.gov/news-events/press-announcements/coronavirus-covid-19-update-april-13-2021>

Websites

none

Site Visits

none

Appendix A – Kinds of SARS-CoV-2 Tests

Kinds of Tests

There are two recognized kinds of tests that pertain to the COVID-19 Pandemic the world has experienced in 2020-2021: **diagnostic tests** and **antibody tests**.

Diagnostic Tests

Diagnostic tests determine if a person currently has an infection that could be transmitted to others thus spreading the disease. Most commonly a person is infected for 10-14 days.

The two most prominent diagnostic tests that have been developed to detect the SARS-CoV-2 virus that causes the COVID-19 disease in a person's body are 1) molecular tests, commonly called PCR tests, that detect the presence virus's genetic material and 2) antigen tests that detect special components of the actual virus.

Antibody Tests

Antibody tests look for your own body's virus fighting antibodies; having those antibodies present in your system indicates that you have previously encountered that virus and your body generated antibodies to fight it. The antibodies may last for long periods, months or years.

Diagnostic Testing

The tests most commonly available and discussed in the United States to date have been PCR diagnostic tests developed by commercial, educational and government organizations including UCSC and the United States Center for Disease Control and Prevention (CDC). The usefulness of these tests depends upon several factors:

- How easy the test is to administer,
- How quickly the tests results are available,
- How effective the test is for not giving false negative results (indicating you are not infected when you are), and
- How effective it is for not giving false positive results (indicating that you are infected when you are not).

These diagnostic tests, when they work effectively, only detect if a person is currently infected and that period lasts in most people for 10-14 days. It is easily possible for a person to become infected immediately after getting a negative test. It is also possible for a person to be infected for a period much longer than 14 days.

There are two primary uses for diagnostic tests:

1. To distinguish those genuinely infected with the SARS-CoV-2 virus from those not infected but perhaps showing similar symptoms. Those infected can be

effectively treated and kept from spreading the disease further. Those not infected with SARS-CoV-2 virus can be diagnosed and treated further knowing that they are not a risk for spreading the COVID-19 disease.

2. Detect asymptomatic infected people (a person infected but not showing any symptoms).

The FDA has granted over 230 Emergency Use Authorizations for these kinds of tests. Their quality varies widely.

Antibody Testing

A person who has become a COVID-19 “case” is known to have been infected by the virus and, once recovered, will not likely be a risk for infecting others. There is an unproven belief that a person cannot be infected more than once with the same strain of the virus. Antibody testing will reveal that a person had COVID-19 even though they had been asymptomatic.^[86]

The FDA has granted over 65 Emergency Use Authorizations for these kinds of tests.

Asymptomatic Infection

As the COVID-19 disease has spread and been studied more, it is believed that from 30% to 40% of those infected are asymptomatic. So, for example, if 10 cases of infection were detected in your community on one day, there may be another 3-4 cases that go undetected. These undetected, yet infected people, make controlling the spread of the virus extremely complex.

As of today, 358 tests and sample collection devices are authorized by the FDA under emergency use authorizations (EUAs). These included:

- 262 PCR molecular tests and sample collection devices,
- 75 antibody and other immune response tests, and
- 21 antigen tests.

For home sample collection:

- 45 molecular authorizations and
- one antibody authorization.

For home test results:

- one molecular *prescription* at-home test,
- 2 antigen *prescription* at-home tests,
- 4 over-the-counter at-home antigen tests, and
- 2 over-the-counter molecular tests.

The FDA has authorized tests for pooling/serial screening programs:

- 7 antigen tests and
- 2 molecular.^[87]

Appendix B – HSA Concept Paper

COVID-19 Surveillance, Monitoring and Mitigation: Key Public Health Infrastructure Needed to Shift from Emergency Response to Sustainable Containment

April 10, 2020 Draft Concept

Mimi Hall, Director, County of Santa Cruz Health Services Agency

The current Public Health response to COVID-19 has lacked foundational public health infrastructure for early and effective response in keeping with proven public health approaches. As a result, containment and mitigation measures have necessarily focused on Shelter In Place and Social Distancing Strategies. However, essential public health actions are needed to mitigate future waves and sustain a long term reduction in new cases before a vaccine is widely available and more is known regarding immunity. These include:

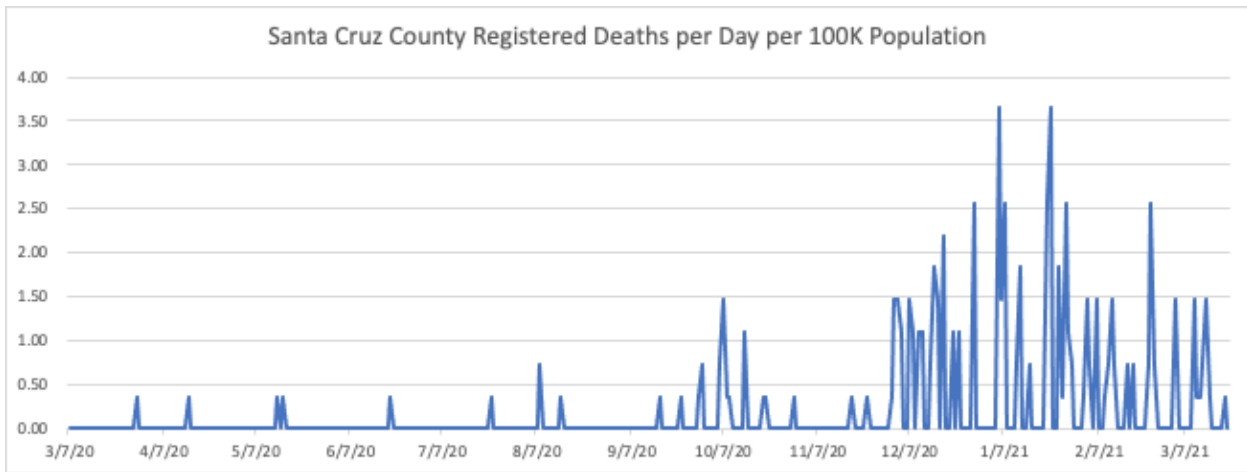
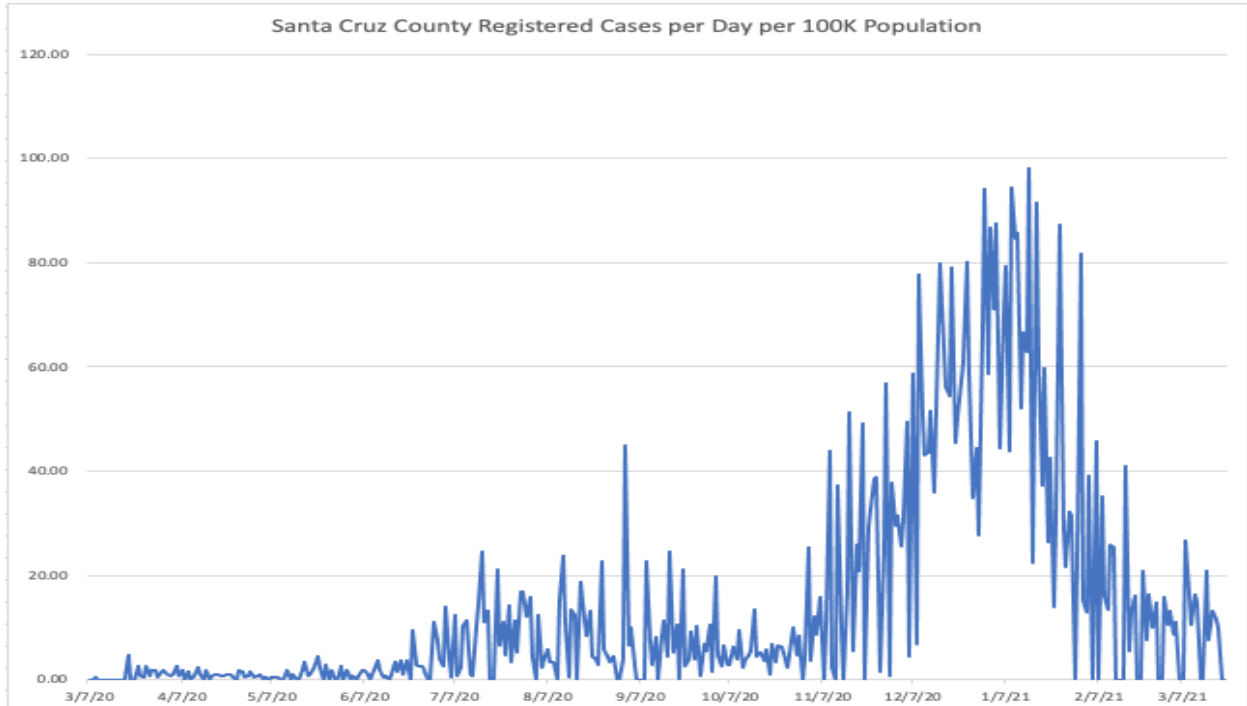
1. Widespread surveillance and monitoring
2. Rapid and responsive case investigation
3. Ability to quarantine known exposures and isolate positive cases
4. Nimble and accurate public communication

With this critical infrastructure in place, Santa Cruz County could ease social distancing guidelines, begin a return to social and economic normalcy, and quickly identify and control COVID-19 until a vaccine is available or widespread immunity is attained.

1. Widespread surveillance and monitoring
 - a. Testing – broad and accessible testing through all levels of the healthcare system
 - b. Agreements with sentinel surveillance sites and syndromic surveillance partners such as education, large employers and health care systems
 - c. Enhanced data sharing across health and non-health systems building out utility of the newly constructed data sharing platform and Santa Cruz Health Information Organization's countywide HIE
 - d. Increased epidemiological capacity at local health jurisdiction level
2. Rapid and responsive case investigation
 - a. Training of existing workforce in health system other disciplines trained in investigations to expand capacity for communicable disease investigations and contact tracing. Possible agreements with health officials for reporting
 - b. Shared reporting system and oversight of reporting and compliance
3. Ability to quarantine known exposures and isolate positive cases
 - a. Agreements with public and private partners to identify and assign locations and staffing for isolation and quarantine locations.
 - b. Expertise to set protocol and agreements across jurisdictions.
4. Nimble and extensive public campaign and system of public information and alerts to update the public of changing situations to alert and test those who may have been exposed beyond contact tracing (similar to systems we have in place for first responders).

Appendix C – Santa Cruz County COVID-19 Data

The charts below show the cases and deaths attributed to COVID-19 per 100,000 people in Santa Cruz County (SSC population number used: 273,213) for the year March 7, 2020 through March 7, 2021.



The first case of COVID-19 in Santa Cruz County was registered on March 6, 2020. The first death in Santa Cruz County attributed to the COVID-19 disease was on March 28, 2020. At that time the County had registered 39 total cases. The total number of deaths in the County didn't reach 10 until September 29, 2020.^[27]

Appendix D – Getting a COVID-19 Test Can Be Challenging

This is a walk-through example of getting a COVID-19 PCR test at the Ramsey Park site recommended on the HSA website^[82] for “non-sick” people.

Our Hypothetical Setup

Our hypothetical young woman has not had COVID-19 to her knowledge, has no symptoms, does have medical insurance and is planning to travel out of state on business. Getting a negative test would make her feel more responsible while travelling.

She uses Google to search for “covid testing in Santa Cruz” and gets directed to the Santa Cruz County Health Services Agency “Get Tested” webpage. This page contains a listing of 18 sites where she could get tested in Santa Cruz County. The page starts with some information about pharmacies providing tests, a suggestion to call ahead and a link to a state testing search site. She continues to scroll through the site listing and comes to a notice at the very bottom of the page: “If I’m not sick, should I schedule an appointment for testing at the OptumServe community testing site in Watsonville?” Exactly what she was looking for.

Noticing that the word OptumServe (whatever that is) is a highlighted link, she clicks on it and is brought to a site “lhi.care/covidtesting”. There she is given the opportunity to select “California” as her area and is directed to this outline of how to proceed:

- Step 1. If eligible, register as a patient and create an account on this site.
- Step 2. After logging in, choose a testing location and schedule an appointment.
- Step 3. Attend your scheduled testing appointment.
- Step 4. On-location staff will check you in, conduct testing and send samples to the lab.
- Step 5. We'll inform you when your results are back from the lab and available on LHI.Care, typically within 4 to 6 days.

Registration is required, so she fills out a long list of health and personal questions that verge on intrusive and seem unnecessary, but are all marked as required; things like sexual orientation, race, and language spoken at home. Then it asks if you have health insurance. If she checks NO another checkbox pops up that displays: “By clicking this box you attest that you do not have any health insurance/coverage available.” So, best not to lie. If she checks YES she has to fill out all the pertinent information about her insurance including enough for the company to be billed.

Once she gets through that section she is asked to complete “registration” by completing all personal contact information including phone number or email address where the test results can be returned.

Finally, after about 25 minutes she enters a page where she can choose a location, a date and time interval to have her test.

If our young woman had clicked on the text of the HSA site recommending Ramsey park it would have expanded into 10 bullet points which include this one:

- Although you will be asked for insurance information and a valid identification at the time of check-in, neither is required to receive testing.

Whoever wrote that didn't ever try to register with LHI, since filling in all of the queries is necessary for being allowed to continue the registration.

We also point out the following which she may or may not have figured out:

1. The "Ramsey Park" site is one of about 80 sites distributed around California by the California Department of Public Health.
2. California had a contract with OptumServe, a large health care company, to manage all of these sites.
3. Ramsey Park is actually a Watsonville City park arranged to be used by HSA on behalf of the state.
4. OptumServe is part of Optum Group which is owned by the UnitedHealth Group.
5. LHI is yet another healthcare organization and is really Logistics Health Incorporated and is owned by Optum Group.

When our young woman goes to Ramsey Park she finds little in the way of signage for who actually is running the place. If she asks she will be told "OptumServe." One might think that the state and county might want to take some credit for establishing this service!

It is truly amazing how many steps, how many government agencies and how many companies are involved in our young woman getting tested for COVID-19. The HSA website could help. For example: is the LHI.care website legitimate? A person concerned about web security would be wise not to interact with this strangely named and unknown website (domain ".care"?). HSA could also soothe uneasiness by explaining that OptumServe has been contracted by the state to run this site.